

What is claimed is:

1. An abnormality detecting apparatus for a vibration-type angular velocity sensor that detects an abnormal condition of the vibration-type  
5 angular velocity sensor, comprising:

frequency component extracting means for extracting a specific frequency component having the possibility that said angular velocity sensor may produce an erroneous output, based on an acceleration signal detected by an acceleration sensor disposed in the vicinity of said vibration-type  
10 angular velocity sensor; and

judging means for comparing a level of said specific frequency component extracted by said frequency component extracting means with a predetermined level and producing a signal notifying an abnormal condition of said angular velocity sensor when the level of said specific frequency  
15 component is larger than said predetermined level.

2. The abnormality detecting apparatus for a vibration-type angular velocity sensor in accordance with claim 1, wherein

said specific frequency component having the possibility that said angular velocity sensor may produce an erroneous output is a driving system resonance frequency relating to a driving system of said angular velocity sensor and/or a difference frequency between said driving system resonance frequency and a sensing system resonance frequency relating to a sensing system of said angular velocity sensor.  
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3. The abnormality detecting apparatus for a vibration-type angular velocity sensor in accordance with claim 1, wherein said vibration-type angular velocity sensor and said acceleration sensor are installed in the same casing.  
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4. An abnormality detecting method for a vibration-type angular velocity sensor that detects an abnormal condition of the vibration-type angular velocity sensor, comprising the steps of:

extracting a specific frequency component having the possibility that  
5 said angular velocity sensor may produce an erroneous output, based on an acceleration signal detected by an acceleration sensor disposed in the vicinity of said vibration-type angular velocity sensor; and

comparing a level of said specific frequency component extracted in  
said frequency component extracting step with a predetermined level and  
10 producing a signal notifying an abnormal condition of said angular velocity sensor when the level of said specific frequency component is larger than said predetermined level.

5. The abnormality detecting method for a vibration-type angular  
15 velocity sensor in accordance with claim 4, wherein

said specific frequency component having the possibility that said angular velocity sensor may produce an erroneous output is a driving system resonance frequency relating to a driving system of said angular velocity sensor and/or a difference frequency between said driving system resonance  
20 frequency and a sensing system resonance frequency relating to a sensing system of said angular velocity sensor.

6. The abnormality detecting method for a vibration-type angular velocity sensor in accordance with claim 4, wherein said vibration-type  
25 angular velocity sensor and said acceleration sensor are installed in the same casing.

7. The abnormality detecting method for a vibration-type angular velocity sensor in accordance with claim 4, wherein said steps are executed  
30 by an electric circuit having the capability of executing hardware processing

or by a computer having the capability of executing software processing according to a predetermined algorithm.

8. An abnormality detecting program executed in a computer for  
5 realizing an abnormality detecting method for a vibration-type angular velocity sensor that detects an abnormal condition of the vibration-type angular velocity sensor, said abnormality detecting method comprising the steps of:

extracting a specific frequency component where having the  
10 possibility that said angular velocity sensor may produce an erroneous output, based on an acceleration signal detected by an acceleration sensor disposed in the vicinity of said vibration-type angular velocity sensor; and

comparing a level of said specific frequency component extracted in  
said frequency component extracting step with a predetermined level and  
15 producing a signal notifying an abnormal condition of said angular velocity sensor when the level of said specific frequency component is larger than said predetermined level.

9. A vehicle control system comprising an abnormality detecting  
20 apparatus that detects an abnormal condition of a vibration-type angular velocity sensor, an actuator that executes a brake control of said vehicle, and a vehicle stability control apparatus that manages said brake control executed by said actuator, wherein

said abnormality detecting apparatus comprising:  
25 frequency component extracting means for extracting a specific frequency component having the possibility that said angular velocity sensor may produce an erroneous output, based on an acceleration signal detected by an acceleration sensor disposed in the vicinity of said vibration-type angular velocity sensor; and

30 judging means for comparing a level of said specific frequency

component extracted by said frequency component extracting means with a predetermined level and producing a signal notifying an abnormal condition of said angular velocity sensor when the level of said specific frequency component is larger than said predetermined level, and

5        said vehicle stability control apparatus limits said brake control executed by said actuator when said vehicle stability control apparatus receives the signal notifying the abnormal condition of said angular velocity sensor from said abnormality detecting apparatus.

10        10. An abnormality detecting apparatus for a vibration-type angular velocity sensor that has a vibrator element driven at a predetermined resonance frequency and detects an angular velocity based on a displacement of said vibrator element in a sensing direction normal to a vibrating direction of said vibrator element, comprising:

15        first judging means for detecting a frequency at which said vibrator element causes a displacement in said sensing direction and checks whether or not the detected frequency is within a specific frequency range having the possibility that said angular velocity sensor may produce an erroneous output; and

20        second judging means for generating an abnormality signal when it is judged by said first judging means that the detected frequency is within said specific frequency range.